CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
850 Marina Bay Parkway, Richmond, CA 94804

ENVIRONMENTAL MANAGEMENT BRANCH
Marine Biotoxin Monitoring Program

Monthly Marine Biotoxin Report

April 2008

Technical Report No. 08-16

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of April, 2008. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was observed at sampling stations between Santa Barbara and San Diego counties during April (Figure 1). The distribution and relative abundance was reduced from observations in March for most

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during April, 2008.

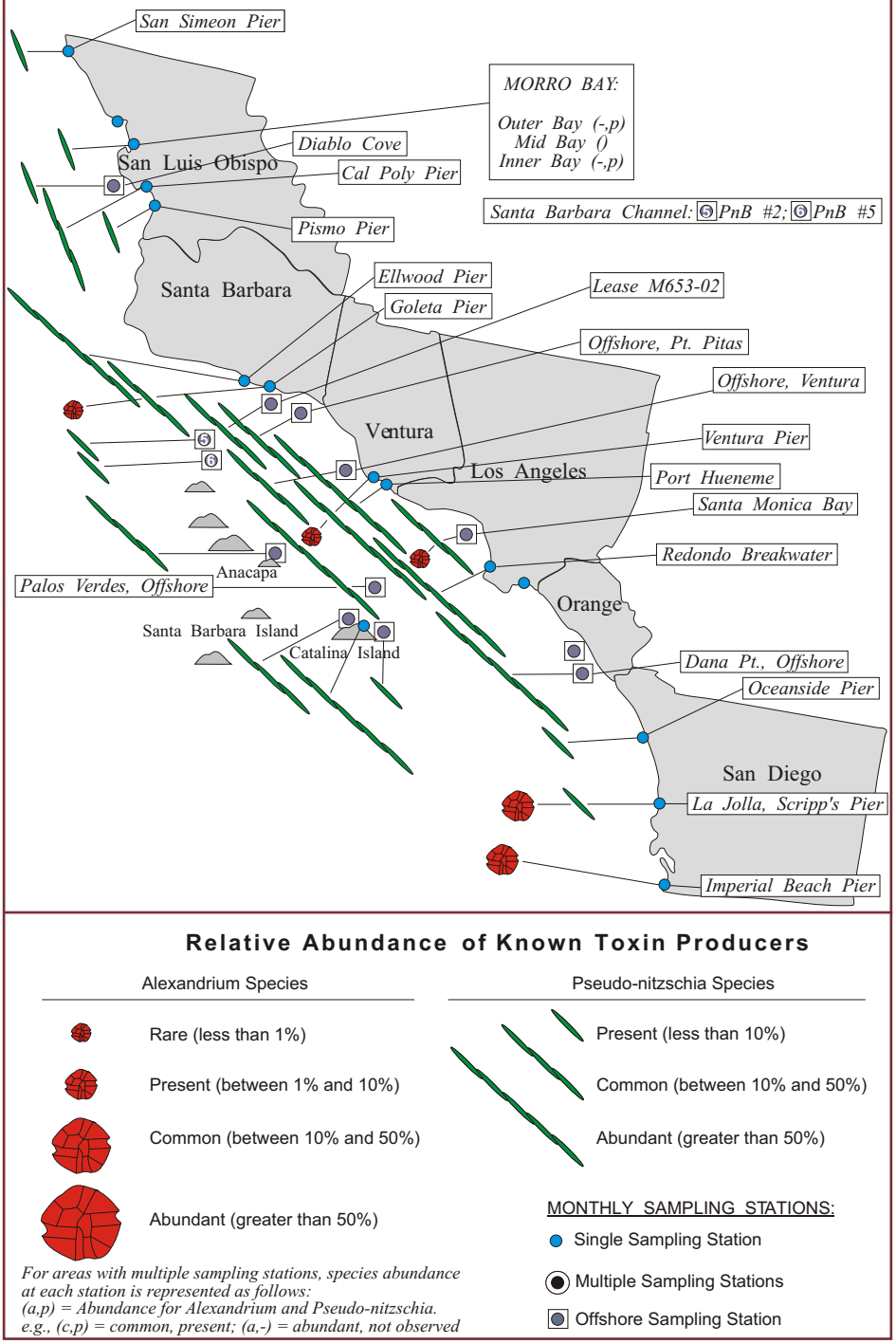
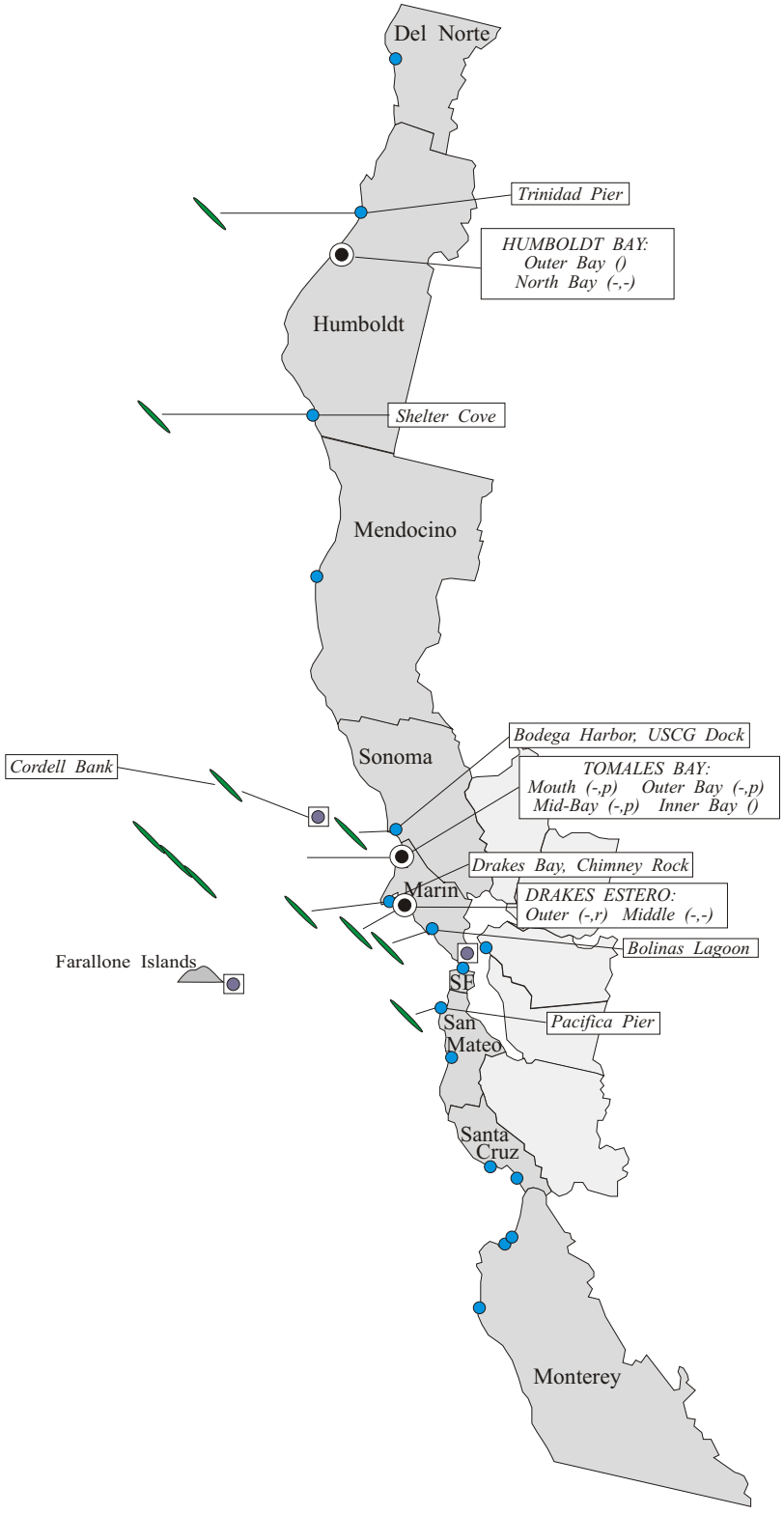


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during April, 2008.



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sites. The relative abundance of this dinoflagellate was highest at sites in San Diego County.

Low concentrations of PSP toxins continued to be detected in mussels at a number of sites between Santa Barbara and San Diego counties throughout the month (Figure 3). Mussel samples from Agua Hedionda Lagoon remained close to, but below, the alert level through the first week of April. A low level of PSP toxins was also detected in a sample of littleneck clams from northern San Diego County on April 9.

Domoic Acid

Pseudo-nitzschia was detected at numerous sites between San Luis Obispo and San Diego counties during April (Figure 1). The distribution of this diatom was similar to observations in March but the relative abundance increased significantly at sites between Santa Barbara and Orange counties. The highest relative abundance of *Pseudo-nitzschia* was observed offshore of the Palos Verdes peninsula (Los Angeles County).

Low levels of domoic acid were detected in shellfish samples from sites in Santa Barbara, Ventura, and Los Angeles counties (Figure 3). The highest concentration detected was 12 ppm in a mussel sample

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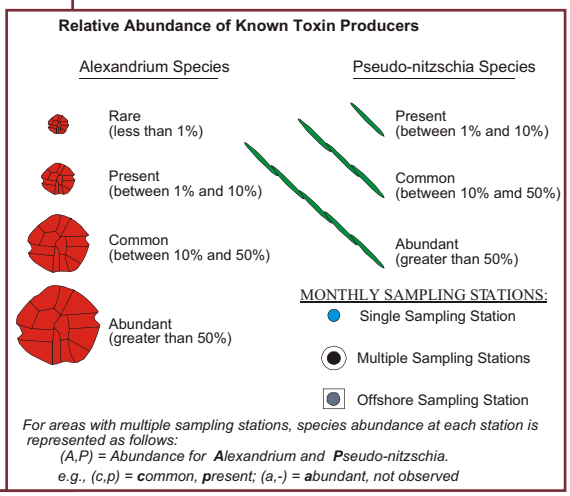
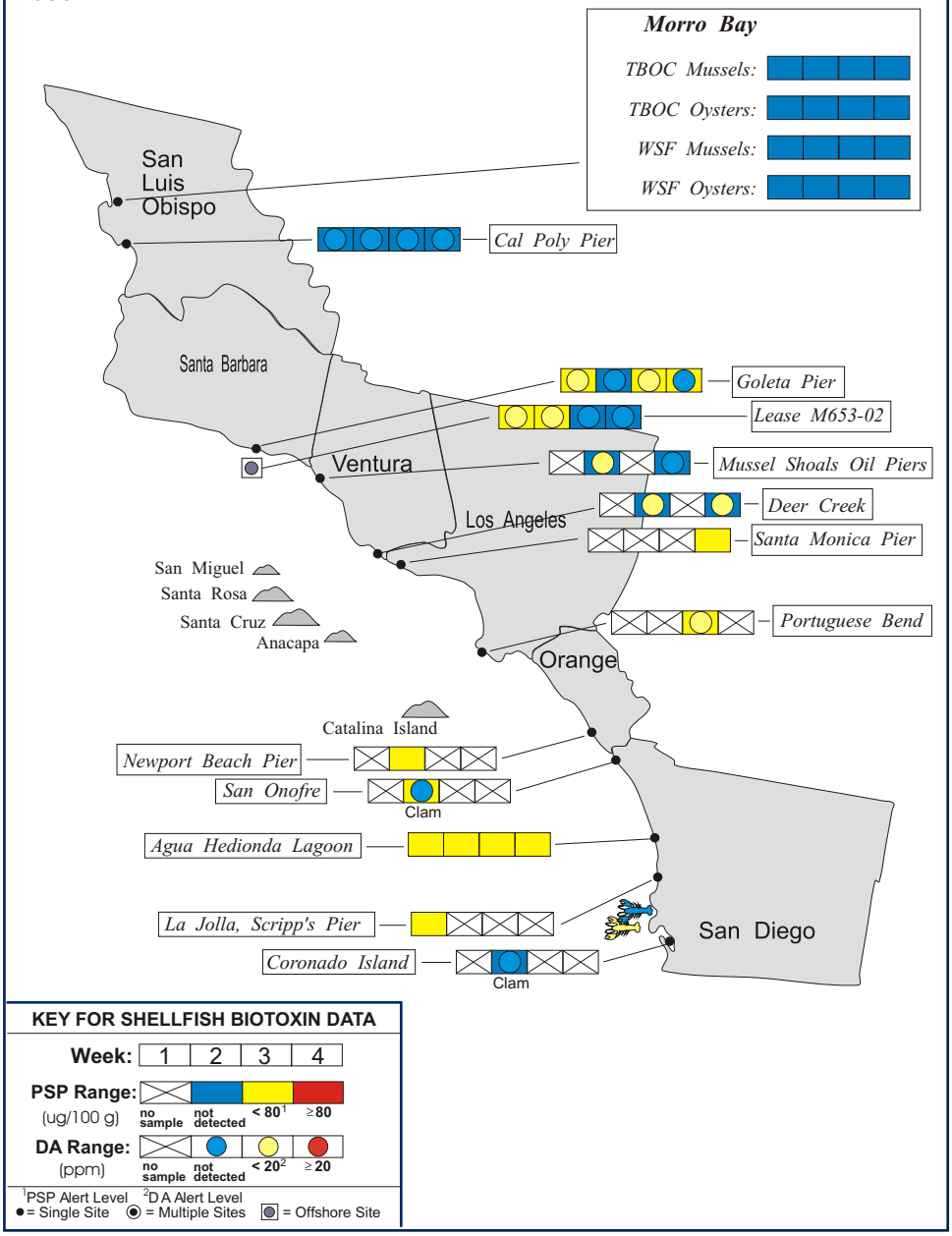


Figure 3. Distribution of shellfish biotoxins in Southern California during April, 2008.



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from Deer Creek (Ventura County) collected on April 8.

Non-toxic Species

Diatoms were dominant between San Luis Obispo and Santa Barbara counties. *Chaetoceros* remained the dominant diatom, although *Detonula*, *Skeletonema*, and *Thalassiosira* were also common. A mix of diatoms and dinoflagellates were observed at sites between Ventura and San Diego counties, with several dinoflagellate species becoming more common towards the end of the month. Common dinoflagellates included *Lingulodinium, Ceratium*, and *Akashiwo*.

Northern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any northern California sampling stations in April (Figure 2). PSP toxicity was not detected in any shellfish samples from this region during the month (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed in very low numbers at a few sites along the northern California coast in April (Figure 2). The distribution and relative abundance of this diatom were similar to observations in

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The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553 - 4133

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March. Domoic acid was not detected in any shellfish samples analyzed in April.

Non-toxic Species

The phytoplankton assemblage increased dramatically in diversity and relative abundance as winter gave way to spring conditions along the northern California coast. Diatoms dominated the assemblage, with *Chaetoceros* and *Thalassiosira* the most abundant genera. *Corethron*, *Melosira*, and *Odontella* were common at specific sites along the coast. The only dinoflagellates observed were *Prorocentrum* and *Heterocapsa*, both found inside Tomales Bay (Marin County) at the beginning of the month.

QUARANTINES:

The annual mussel quarantine is scheduled to go into effect on May 1, barring a sudden increase in toxin levels prior to that time. The annual quarantine applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the year, not just within the quarantine period. This allows the detection of unexpected increases in biotoxin activity outside of the routine quarantine period. The annual quarantine

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Figure 4. Distribution of shellfish biotoxins in Northern California during April, 2008.

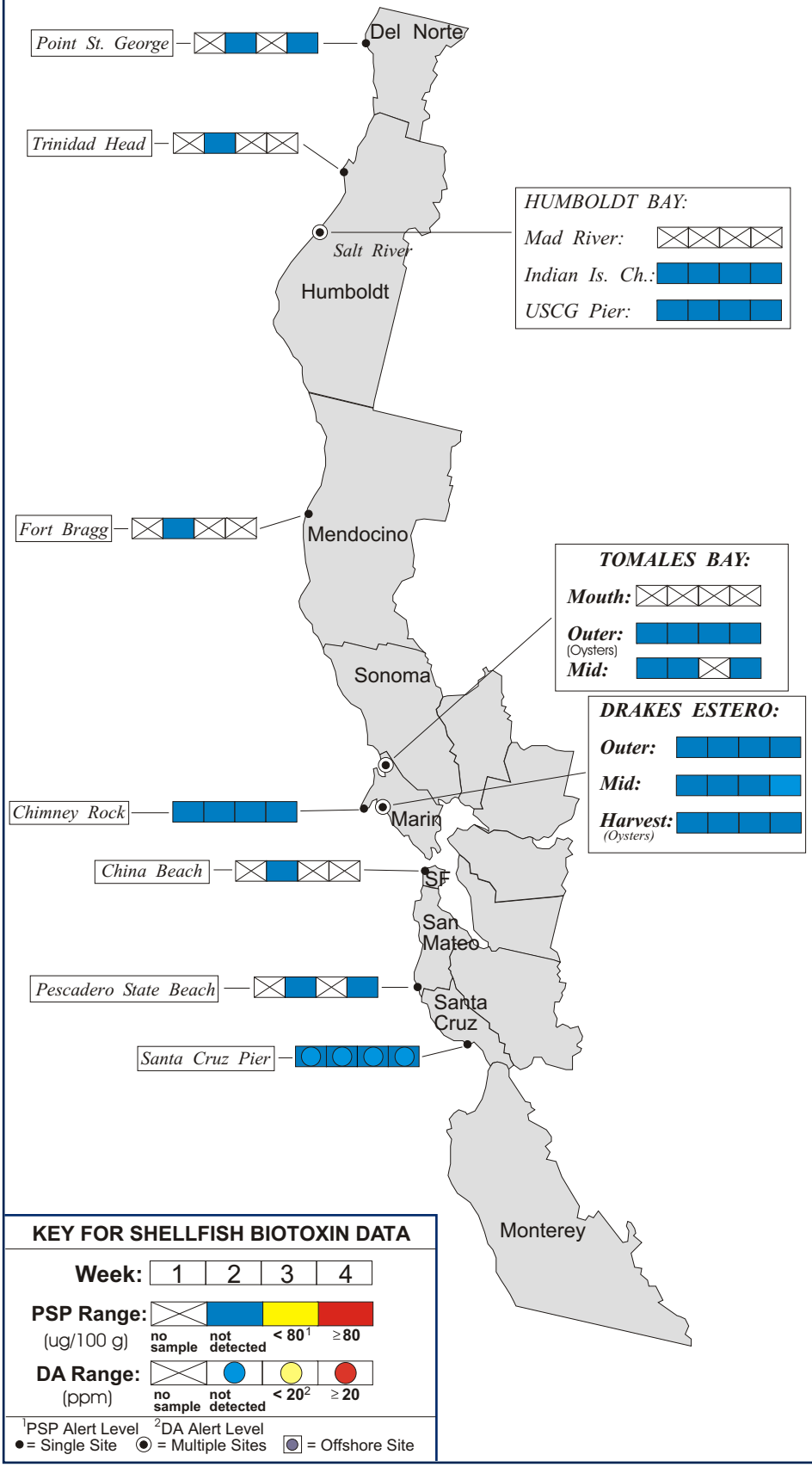

Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during April, 2008.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	2
Humboldt	Coast Seafood Company	9
	Humboldt County Environmental Health Department	1
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	20
	Hog Island Oyster Company	4
	Marin Oyster Company	3
	CDPH Marine Biotoxin Monitoring Program	10
San Francisco	San Francisco Health Department	1
San Mateo	San Mateo County Environmental Health Department	2
Santa Cruz	U.C. Santa Cruz	5
Monterey	None Submitted	
San Luis Obispo	Cal Poly	5
	Tomales Bay Oyster Company	10
	Williams Shellfish Farms	8
Santa Barbara	Santa Barbara Mariculture Company	8
	U.C. Santa Barbara	5
Ventura	Ventura County Environmental Health Department	4
Los Angeles	Los Angeles County Health Department	2
Orange	Orange County Health Care Agency	1
San Diego	Carlsbad Aquafarms, Inc.	8
	Scripps Institute of Oceanography	5
	CDPH Volunteer (Steve Crooke)	2

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does not apply to the certified commercial shellfish growing areas in California, which are monitored intensively. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera. These toxins may also accumulate in the viscera of other seafood species such as crab, lobster, and small finfish like sardines and anchovies.

PSP toxins affect the human central nervous system, producing a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms typically are followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

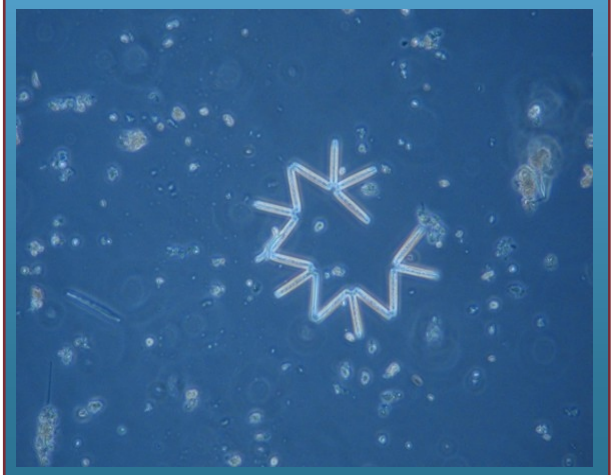
Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.

Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during April, 2008.

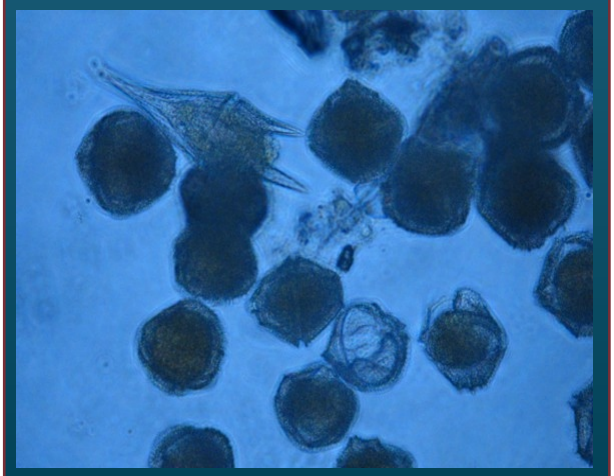
		#
Del Norte	Del Norte County Health Department	3
Humboldt	Coast Seafood Company	5
	California Department of Fish and Game	3
Mendocino	California Department of Fish and Game	1
Sonoma	Cordell Banks National Marine Sanctuary	1
	CDPH Volunteer (Cathleen Cannon)	1
Marin	CDPH Volunteers (*B. Anderson, C. Strobel, R. Plant)*	6
	Drakes Bay Oyster Company	10
	CDPH Marine Biotoxin Program	5
Contra Costa	CDPH Marine Biotoxin Program	1
San Francisco	CDPH Volunteer (*Eugenia McNaughton*)	3
	Oikonos	2
San Mateo	The Marine Mammal Center (*Stan Jensen*)	5
	San Mateo County Environmental Health Dept.	1
	CDPH Volunteer (Kathleen Abadie)	3
Santa Cruz	U.C. Santa Cruz	5
	The Marine Mammal Center (*Nancy Scarborough*)	1
Monterey	Monterey Abalone Company	3
	Marine Pollution Studies Laboratory	2
	CDPH Volunteer (Jerry Norton)	1
San Luis Obispo	Cal Poly	13
	The Marine Mammal Center (Tim Lytsell)	6
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	1
	Tenera Environmental	4
Santa Barbara	CDPH Volunteer (*Sylvia Short*)	5
	Channel Islands National Marine Sanctuary	5
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
Ventura	CDPH Volunteer (Fred Burgess)	4
	Channel Islands National Marine Sanctuary	2
	National Park Service	1
	Ventura County Environmental Health Department	2
Los Angeles	Los Angeles County Health Department	6
	Catalina Island Marine Institute	2
	Guided Discoveries, Tole Mour	6
	Southern California Marine Institute	1
Orange	Orange County Health Care Agency	1
	Ocean Institute	2
San Diego	Avian Research Associates	4
	Scripps Institute of Oceanography	4
	CDPH Volunteer (*Paul Sims*)	1

PHYTOPLANKTON GALLERY



The diatom Thalassionema is often present in low numbers along the California coast.

The diatom Ditylum has been observed at a number of sampling station this spring.



The dinoflagellate Lingulodinium was common in Santa Monica Bay and from sites along the San Diego coast.